IN THE CLAIMS:

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1. (currently amended) A modulator ~~quadrature amplitude modulation signal space,~~ comprising:

a symmetric spherical quadrature amplitude modulation constellation in a multi-dimensional complex plane, the constellation bounded by a surface further comprising all symbol points at a predetermined distance from a center point, coincident with an intersection of at least two axes, and corresponding in relative position to the symbol points on opposite sides of the axes.

2. (currently amended) The modulator of claim 1, ~~quadrature amplitude modulation signal space of claim 1~~ wherein the symmetric spherical quadrature amplitude modulation constellation further comprises:

N symbol points mapped in a two-dimensional complex plane identified by an in-phase and a quadrature axis, where $N = 2^n$ and n represents the number of bits in a binary word;

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equidistant spacing between each N symbol point and its adjacent neighbor(s);

an innermost amplitude ring having four equally spaced symbol points;

at least one shell comprising n_{shell} amplitude rings where,

$$N_{shell} = \sqrt{N/4} \qquad \text{and} \qquad n_{pt,shell} = 4 + 8(n_{shell}-1)$$

where N_{shell} represents the total number of shells in the constellation, N represents the total number of symbols in the constellation, $n_{pt,shell}$ represents the number of symbols on the at least one shell identified by the shell index, n_{shell};

four diameters, passing through the origin. A first two of the four diameters intersecting at substantially 90°, and a second two of the four diameters intersecting at substantially

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90°. The first two diameters rotated relative to the second two diameters at substantially 45°;

n_{shell} amplitude rings comprising 4 symbol points when the symbol points exist on the diameters;

n_{shell} amplitude rings comprising 8 symbol points when the symbol points exist off the diameter;

the N symbol points exhibiting eighth fold symmetry with point group type *4mm*.

3. (currently amended) The modulator ~~quadrature amplitude modulation signal space~~ of claim 2 wherein an "I" denotes the in-phase axis and a "Q" denotes the quadrature axis.

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4. (currently amended) The modulator ~~quadrature amplitude modulation signal space~~ of claim 2, where n is an integer.

5. (currently amended) The modulator ~~quadrature amplitude modulation signal space~~ of claim 2, where *n* is a non-integer.

6. (currently amended) The modulator ~~quadrature amplitude modulation signal space~~ of claim 2, wherein ~~a method of generating~~ the N symbol points further comprises:

~~generating~~ an amplitude and a phase component for N/8 symbol points wherein the phase component of the symbol point, as identified by the location of the symbol point relative to the in-phase axis, is between 0° and 45°;

~~generating~~ the amplitude and the phase component for the remaining (N – N/8) symbol points ~~by swapping of quadrature and in-phase component values and sign-change operations~~ are such that,

(Ij, Qj) represents a symbol point, j, with a phase component of $0° \leq \theta \leq 45°$

(Qj, Ij) represents a symbol point, j, with a phase component of $45° < \theta \leq 90°$

(-Qj, Ij) represents a symbol point, j, with a phase component of $90° < \theta \leq 135°$

(-Ij, Qj) represents a symbol point, j, with a phase component of $135° < \theta \leq 180°$

(-Ij, -Qj) represents a symbol point, j, with a phase component of $180° < \theta \leq 225°$

(-Qj, -Ij) represents a symbol point, j, with a phase component of $225° < \theta \leq 270°$

(Qj, -Ij) represents a symbol point, j, with a phase component of $270° < \theta \leq 315°$.

(Ij, -Qj) represents a symbol point, j, with a phase component of $315° < \theta < 360°$

7. (currently amended) A ~~method of employing the~~ quadrature amplitude modulation ~~signal space of claim 2~~ method comprising:

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receiving a binary data stream of n bits at a rate of 1/T;

segmenting the binary data stream to produce 2^n binary words comprising n data bits per binary word, where n is an integer;

mapping the binary words to the symmetric spherical quadrature amplitude modulation constellation symbol points;

transmitting the symbol points over a transmission medium.

8. (original) The method of claim7, further comprising the step of encoding the binary data by error-correction means prior to segmenting the binary data stream.

9. (original) A quadrature amplitude modulation method, comprising the steps of:

receiving a binary data stream of n bits at a rate of 1/T;

encoding the binary data by error-correction means;

segmenting the encoded binary data stream to produce 2^n binary words comprising n data bits per word;

generating $2^n/8$ symbol points wherein the phase component of the symbol point is between 0° and 45°.

generating the remaining (2^n- $2^n/8$) symbol points by swapping of quadrature and in-phase component values and sign-change operations such that,

(Ij, Qj) represents a symbol point, j, with a phase component of $0° \leq \theta \leq 45°$
(Qj, Ij) represents a symbol point, j, with a phase component of $45° < \theta \leq 90°$
(-Qj, Ij) represents a symbol point, j, with a phase component of $90° < \theta \leq 135°$
(-Ij, Qj) represents a symbol point, j, with a phase component of $135° < \theta \leq 180°$
(-Ij, -Qj) represents a symbol point, j, with a phase component of $180° < \theta \leq 225°$
(-Qj, -Ij) represents a symbol point, j, with a phase component of $225° < \theta \leq 270°$
(Qj, -Ij) represents a symbol point, j, with a phase component of $270° < \theta \leq 315°$.
(Ij, -Qj) represents a symbol point, j, with a phase component of $315° < \theta < 360°$

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mapping the symbol points in a symmetric spherical quadrature amplitude modulation constellation in a two-dimensional complex plane identified by an in-phase and a quadrature axis, comprising an innermost ring having four equally spaced symbol points, further comprising at least one shell comprising n_{shell} amplitude rings where $N_{shell} = \sqrt{N/4}$ and $n_{pt,shell} = 4 + 8(n_{shell}-1)$, where N_{shell} represents the total number of shells in the constellation, N represents the total number of symbols in the constellation, $n_{pt,shell}$ represents the number of symbols on the at least one shell identified by the shell index, n_{shell}, further comprising, four diameters, passing through the origin, a first two of the four diameters intersecting at substantially 90°, and a second two of the four diameters intersecting at substantially 90°, the first two diameters rotated relative to the second two diameters at substantially 45°, where n_{shell} amplitude rings comprise 4 symbol points when the symbol points exist on the diameters and n_{shell} amplitude rings comprise 8 symbol points when the symbol points exist

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off the diameter, the symbol points having equidistant spacing between symbol points and its adjacent neighbor(s) and the symbol points exhibiting eighth fold symmetry with point group type *4mm*;

mapping the binary words to the symmetric spherical quadrature amplitude modulation constellation symbol points;

transmitting the symbol points over a transmission medium.